Postings: from the desk of Jim Brodrick

As you might expect, these *Postings* generate a fair number of questions and comments. I try to respond individually to as many as I can, but some of them are best dealt with in a *Posting*. Here are several I received recently:

Why does DOE only fund solid-state lighting (SSL) and not other lighting technologies? DOE is congressionally mandated by the Energy Policy Act of 2005 to accelerate SSL technology because both Congress and DOE recognize its tremendous energy-saving potential. The incumbent lighting technologies have all been around for a while and thus don't offer the same headroom and scope for development as SSL - which, even in its present state of relative infancy, clearly shows substantial energy-saving promise. We estimate that switching to LED lighting over the next 20 years could save $280 billion in energy costs over that period, reduce the electricity consumption for lighting by one-third, and avoid 500 metric tons of carbon emission.

But that's not to say that DOE ignores other lighting technologies. While our long-term lighting focus is to advance SSL R&D, we also make substantial investments to promote the use of highly efficient conventional lighting technologies, through DOE implementation programs such as Building America, the Commercial Building Initiative, and the Federal Energy Management Program.

With three annual workshops that collectively bring together more than 1,000 attendees, as well as periodic stakeholder roundtables, DOE's solid-state lighting program is open and participatory and coordinates with many lighting and standards groups, such as the Illuminating Engineering Society of North America, the International Association of Lighting Designers, the National Electrical Manufacturers Association, the American National Standards Institute, and the National Institute of Standards and Technology. It's also highly transparent, publishing numerous reports and roadmaps

that are posted online at www.ssl.energy.gov.

Why is DOE promoting SSL to such an extent, when so many LED lighting products on the market perform poorly or aren't cost-effective? As a government agency serving all U.S. citizens, DOE brings a "just the facts" attitude and an independent, vendor-neutral perspective to solid-state lighting, which is why so many people look to us for honest, reliable information. But that means we have to tread a narrow path in terms of strongly supporting SSL's development, while at the same time watching closely for problems. We take that role very seriously, starting the Lighting Facts label initiative and the CALiPER testing program, for example, partly in response to the many false claims being made for LED lighting products. And a significant part of our function, as we see it, is to educate consumers as well as the lighting community about those claims and other pitfalls in the SSL marketplace.

A big pitfall, of course, is cost. DOE pays close attention to the cost-effectiveness of commercially available LED luminaires, and we frequently acknowledge that they often fall short in that regard - as our GATEWAY demonstration reports, among other publications, plainly indicate. In addition, we often point out that other lighting technologies are clearly superior to SSL for a number of applications - for example, we've made it clear in our CALiPER reports and workshop presentations that LED products can't yet compete with efficient linear fluorescent systems for ambient lighting.

But we also see plenty of indications that the costs for LED lighting systems will continue to decline rapidly, as the cost projections in our Multi-Year Program Plan show. That's why we're quite optimistic about their cost-effectiveness in the not-so-distant future, and why we're working so hard to nurture the technology today.

Why isn't DOE studying the environmental and health implications of SSL? DOE is currently working with Carnegie Mellon University on a life-cycle assessment of LED lighting, which addresses several environmental issues. But because DOE's mission focuses on saving energy by creating the technical knowledge and market basis for SSL products, some other lighting issues - such as

those involving human health or road safety - may be better addressed by other entities, such as the National Institutes of Health or the Federal Highway Administration.

SSL has a number of advantages from an environmental standpoint, such as the absence of mercury and the intrinsic directionality of LEDs, which makes it easier to concentrate lighting only where it's needed and can eliminate or drastically cut down on spill light as well as uplight that contributes to sky glow. The uniform light distribution of well-designed LED luminaires can also reduce the amount of light that's reflected off of surfaces into the night sky.

Some people have raised concerns about nighttime exposure of humans to blue light, and many of the most efficient outdoor LED lights have substantial blue in their spectra. But though various groups are studying this issue, we know very little about it at this point. And while we don't know whether outdoor lighting is harmful to health, there's no conclusive evidence that LED lighting is any worse than other light sources in this regard. A 2008 IES technical memorandum on the subject concludes that it would be premature to make design recommendations based on such considerations. DOE will continue to track the progress of research in this area to ensure the optimal application of SSL to outdoor environments. For more information, see the new DOE Fact Sheet on this topic.

As always, if you have questions or comments, you can reach me at postings@lightingfacts.com.